

**STRATEGIES FOR FACILITATING SELF-DIRECT AND SELF-REGULATED
LEARNING FOR TECHNOLOGY EDUCATION STUDENTS IN HIGHER
INSTITUTIONS IN NIGER STATE**

BY

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2016/1/63327TI

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY MINNA**

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF SCIENCE EDUCATION,
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION, FEDERAL
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MARCH, 2023

DECLARATION

I hereby declare that this thesis titled: **“Strategies for Facilitating Self Direct and Self Regulated Learning for Technology Education Students in Higher Institutions in Niger State”** is a collection of my original research work and has not been presented for any other qualification anywhere. Information from other sources (published or unpublished) has been duly acknowledged.

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2016/1/63327TI

FEDERAL UNIVERSITY OF TECHNOLOGY,
MINNA, NIGERIA.

Signature & Date

CERTIFICATION

The thesis titled: “**Strategies for Facilitating Self Direct and Self Regulated Learning for Technology Education Students in Higher Institutions in Niger State**” by IBRAHEEM, Basheet Olaitan (2016/1/63327TI) meets the regulations governing the award of degree of Master of Technology of the Federal University of Technology, Minna and it is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This project is dedicated to Almighty Allah, the most merciful, the most beneficent, the most gracious, the omnipresent and omniscient.

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ABSTRACT

The study investigate the strategies for facilitating self directed and self regulated learning for technology education students in higher institutions. Three research questions and three null hypotheses were answered and tested respectively at 0.05 level of significance. Related literature were reviewed. The study adopted descriptive survey research design. A simple random sampling technique was used to sample 100 students and 5 teachers each from the schools in the population of the study.. A structured questionnaire was developed by the researcher and used for data collection, the instrument was face validated and pilot tested before it was used for data collection. Cronbach Alpha reliability method was used to determine the internal consistency of the items and a reliability coefficient of 0.75 was obtained. Data collected was analyzed using Statistical Package for Social Sciences (SPSS) version 23 and t-test was used for analysis. The findings revealed that the groups of respondent are required with the items 1,2,4,5,8 and 10 with the average mean ranging from 3.20 -2.51 and not required with items 3,6,7 and 9 with mean scores ranging between 2.08-2.26, on the self actualisation towards self directed and self regulated learning by technology education students. It was also revealed that the groups of respondent are required with all the items with the average mean ranging from 2.60 – 3.17 on the facilities needed to enhance self-directed and self regulated learning among technology education students. Based on these findings it was recommended that teachers need to be trained with the required skills to facilitate self-directed learning in their classrooms. It was also recommended that students are needed to be supported and direction in making the transition to Self-directed and self regulating learning in technology education.

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CHAPTER ONE

1.0

INTRODUCTION

1.1 Background to the Study

Technology has changed the student approach to learning. It has become a necessity and an integral part of their lives. The confident emergence of learning can be attributed to the rapid and continuous innovation in technology in this digital era (Benson & Kolsaker, 2015). Students are accustomed to using their digital devices for almost everything such as communication, collaboration, and accessing multiple sources of information for solutions. Creating a digital learning environment in higher education is not just about convenience, it is about preparing undergraduates for the future, as digital evolution is the new approach to learning and teaching as reported in the Future of Jobs Report (World Economic Forum, 2018). Additionally, with the current Covid-19 global pandemic, the adoption of digital learning will continue to persist in being the new norm for most higher institutions. Thus, with this situation, the need for students to develop self directed and self-regulated learning with digital literacy skills is even more urgent. Technology education rise of self directed and self-regulated learning and the prevalence of affordable devices have laid the foundation for digital learning.

Self-regulation is the capacity of an individual to personally monitor, control, and manage their behaviour, emotions, or thoughts to reach a goal. Self-regulation is not a person's behaviour or characteristic, Instead, it is a skill that can be developed and mastered. Self-regulated learning (SRL) is based on the belief that students use cognitive, metacognitive, behavioural (Zimmerman, 1986) and motivational components (Pintrich, 1999) to manage their learning processes. Self-regulated learning strategies (SRLS) are used by students to self-observe their progress and to identify the strengths of the used learning

strategies as well as gain awareness of any weaknesses throughout their learning process (Adams *et al.*, 2018).

Self-regulated Learning Strategies (SRLS) are used to assist students to learn efficiently. Examples of SRLS are rehearsal, organization, time management, peer learning, and effort regulation. Indeed, with the growing need to train self-reliant and independent learners to meet the current job-market demands, over the previous three decades, more pedagogical research has concentrated in the field of self-regulated learning (SRL). SRL is a multi-faceted construct that refers to the process by which learners are metacognitively, emotionally, motivationally, and behaviourally active in their own learning (Zimmerman, 1990). SRL is a self-directed process in which learners become masters of their own learning and transform their mental skills into academic skills (Zimmerman, 1990). Highly self-regulated learners are able to understand, control their own learning environments and adapt easily to new learning situations.

SRL not only improves one's educational competences, but also prepares a life-long learner who is able to cope with the professional challenges in his career after school. In fact, in schools nowadays, contrary to what was practiced a few decades ago, learners are not taught how to assimilate knowledge from the teacher, but rather, are guided on how they may learn, which transforms schools from institutions of teaching to institutions of learning. Moreover as Low and Jin (2012) assert, learning, is a kind of complex human activity to be done by students rather than to be done for students.

Self-directed learning comes from Knowles who described it as a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes

(Knowles, 1975). The concept of self-directed learning has undergone a thorough consideration over the last years. What has emerged is an important distinction between the process of self-directed learning and the notion of self-direction as a personality construct (Brockett *et al.*, 1991).

Similarly to the constructs connected with self-directed learning, the terminology of self-regulated learning also has to be clarified. Within cognitive psychology, self-regulated learning has been considered students' independence in learning. Self-regulated learning is an active, constructive process whereby learners set goals for their learning and attempt to monitor, regulate and control their cognition, motivation, and behaviour, guided and constrained by their goals and contextual features on the environment (Pintrich, 2000). Therefore based on the insight stated above the study need to investigate the strategies for facilitating self direct and self regulated learning for technology education students in higher institutions.

1.2 Statement of the Problem

There is evidence that students who are not self-directed learners have a greater risk of failure when placed in the rich and complex environment of online learning (Abar and Loken, 2010). Unfortunately these have often been the very students placed in online courses in order to recover credit or to catch up to their cohort and to graduate on time. Researchers have called for additional study of self-directed learning both in the traditional and the online environment (Abar & Loken, 2010; Song & Hill, 2007). While researchers have investigated factors associated with academic achievement in high school students (Smith, 2009). Undergraduates obtained low ratings on self-regulated abilities as they were still not comfortable with digital learning and preferred traditional learning (Adams *et al.*, 2018;

Anthony et al., 2019). This has led to poor learning performance in digital learning (Hu and Li, 2017).

It was indicated that some teachers have explored different teaching methods and strategies such as collaborative learning, Moston's spectrum of teaching styles, the use of verbal clues and feedback (Zhou, 1994). Yet teachers in general like to stick to convention and give little attention to innovation in their technology education teaching. The academic achievement in Nigeria seems to prevent students from taking part in much technological activities. Parents are concerned about academic success above all and so they do not like to let their children involve in much social activities that can sway them away from their academics, because they think it will take time away from their academic studies and therefore cause them to do badly in their other subjects. Thus, students seem to focus on examination success and put little emphasis on their learning. The main factor that affect students is that facilities and equipment are insufficient and the second one is the students' attitudes towards learning. Teachers consider that the most difficult aspect of teaching is how to understand the students. Teachers are dissatisfied with the attitude the students show towards their learning, Moreover, the teachers think that it is hard to relate to the interests of students and complain about this at great length.

1.3 Purpose of the study

The aim of the study is to investigate the strategies for facilitating self directed and self regulated learning for technology education students in higher institutions. The objectives of the study are specifically to assess;

1. Self actualisation towards self directed and self regulated learning by technology education students

2. Facilities needed to enhance self-directed and self regulated learning among technology education students
3. Teachers attitude towards enhancing self directed and self regulated learning among technology education students

1.4 Research Questions

The following research questions were raised to guide the study

1. What is self actualisation towards self directed and self regulated learning by technology education students?
2. What are the facilities needed to enhance self-directed and self regulated learning among technology education students?
3. What are the teachers attitude towards enhancing self directed and self regulated learning among technology education students?

1.5 Scope of the Study

The scope of the study is delimited to the students self actualisation, facilities needed and teachers attitude. The study was limited to higher institution in Minna. The study will focus on the self actualisation for facilitating self directed and self regulated learning for technology education students, methods to motivate technology education students in higher institutions on self directed and self regulated learning and perceptions of technology education students in higher institutions on self directed and self regulated learning.

1.6 Significance of the Study

The findings of this study would be of immense benefit to policy makers, researchers, technical students and teachers, ministry of education, industries and the society at large. The outcome of the study would be beneficial to the policy makers in planning and decision

making in educational matters on self regulated and self directed. If contents are observed to be better taught with this method, then it will be mandated in the policy for implementation.

The study will also be of great relevance to researchers in the world of academics in the sense that the findings generated from this study contribute immensely to existing body of knowledge and also assist subsequent studies. It is expected that this study will be one of the references for other researchers to get information about students to be self reliant.

The students who are the recipients of the study also benefit from this study. It is expected that this study would overcome the difficulties of students' in internalizing abstract contents and consequently improve their performance. This will place value on them and their certificates; they will be confident and perform well. They will be well equipped, up to date, ready to face modern technological challenges that will make them self-reliant and successful in life.

The ministries at both Federal and State levels are instrumental to policy formulation; the findings of this study might help the policy makers in making necessary reviews and further contribution in the policy formulation process. Officials in the ministry of education (e.g. inspector of schools) can also organize conferences, workshops and seminars so as to communicate to teachers the alternative methods of teaching abstract concepts in electrical and electronic trades.

The researcher will also enlarge his knowledge and gather experience in the course of this study. Other stakeholders like the corporate organizations, and the nation in particular, will also benefit from this study, this is because well-equipped graduates with computer literacy will contribute to organizations success and technological advancement of the nation.

1.7 Hypotheses

The following hypotheses was formulated and tested at 0.05 level of significance

- H₀₁:** There is no significant difference between the mean response of teachers and student on self actualisation towards self directed and self regulated learning by technology education students
- H₀₂:** There is no significant difference between the mean response of teachers and student on the facilities needed to enhance self-directed and self regulated learning among technology education students
- H₀₃:** There is no significant difference between the mean response of teachers and student on teachers attitude towards enhancing self directed and self regulated learning among technology education students.

CHAPTER TWO

LITERATURE REVIEW

2.0

2.1 Theoretical Framework

The theoretical framework of the study are constructivist theory and self determination theory.

2.1.1 Constructivist theory

The constructivist theory is based around the idea that learners are active participants in their learning journey; knowledge is constructed based on experiences. As events occur, each person reflects on their experience and incorporates the new ideas with their prior knowledge. Learners develop schemas to organize acquired knowledge. This model was entrenched in learning theories by Dewey, Piaget, Vygotsky, Gagne, and Bruner. The theory of constructivist learning is vital to understanding how students learn. The idea that students actively construct knowledge is central to constructivism. Students add (or build) their new experiences on top of their current foundation of understanding. As stated by Woolfolk (1993) “learning is active mental work, not passive reception of teaching”.

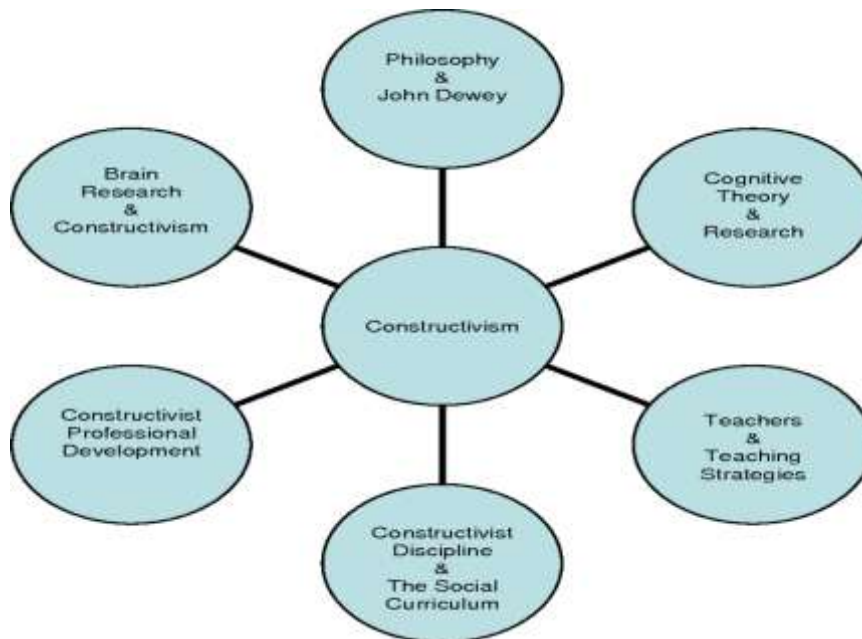


Figure 2.1: Constructivist theory of learning

Source: Woolfolk (1993)

As an educator, it is important to understand the theory of constructivist learning. Each student that enters your classroom has a unique perspective on life that has been created by their unique experiences. This will impact their learning. If the basis of the constructivist theory states that students construct new knowledge on what they have already had, the entry point of their learning journey is of utmost importance. Learning theories are as valuable as credentials to educators; it is important to understand what will affect the learning journey of your students. The theory of constructivism has many elements. These principles outline the theory as a whole and how they affect the learning of the students. The main points are listed below:

Knowledge is constructed: Every student begins the learning journey with some preexisting knowledge and then continues to build their understanding on top of that. They will select which pieces of the experience to add, making everyone's knowledge unique.

Learning is a social activity: Interacting with others is vital to constructing knowledge. Group work, discussions, conversations, and interactions are all important to creating understanding. When we reflect on our past experiences, we can see how our relationship with others is directly connected to the information learned.

Learning is an active process: Students must actively engage in discussions and activities in order to construct knowledge. It is not possible for students to take on a passive role and retain information. In order to build meaningful ideas, there must be a sensory response.

Learning is contextual: Isolation is not the best way to retain information. We learn by forging connections between what we believe and the information we have already. Learning also occurs in the situation within the context of our lives, or alongside the rest of our understanding. We reflect on our lives and classify the new information as it fits into our current perspective.

People learn to learn, as they learn: As each student moves through the learning journey, they get better at selecting and organizing information. They are able to better classify ideas and create more meaningful systems of thought. They also begin to recognize that they are learning multiple ideas simultaneously, for example, if they are writing an essay on historical events, they are also learning elements of written grammar. If they are learning about important dates, they are also learning how to chronologically organize important information.

Learning exists in the mind: Hands-on activities and physical experience are not enough to retain knowledge. Active engagement and reflection are critical to the learning journey. In order to develop a thorough understanding, students must experience activities mentally as well.

Knowledge is personal: Because every person's perspective is unique, so will be the knowledge gained. Every individual comes into the learning activity with their own experiences and will take away different things as well. The theory of constructivist learning is based entirely around each individual's own perspective and experiences.

Motivation is key to learning: Similar to active participation, motivation is key to making connections and creating understanding. Students cannot learn if they are unwilling to reflect on preexisting knowledge and activate their thought process. It is crucial that educators work to motivate their students to engage in the learning journey.

According to the constructivist theory of learning, students build their own understanding of a subject through engaged activities, rather than passively accepting information presented to them. Teachers can support students' constructivism by asking good questions, listening to students' needs, and creating environments that allow students to make choices that reinforce the overall goals for courses (Reeve, 2009). Conversely, when rigid assessment tools are

used, students lose control and autonomy over their learning, reducing their intrinsic motivation (Flint & Johnson, 2011).

2.1.2 Self-determination theory (SDT)

Self-determination theory (SDT) is a macro theory of human motivation and personality that concerns people's innate growth tendencies and innate psychological needs. It pertains to the motivation behind people's choices in the absence of external influences and distractions. SDT focuses on the degree to which human behavior is self-motivated and self-determined. In the 1970s, research on SDT evolved from studies comparing intrinsic and extrinsic motives, and from growing understanding of the dominant role that intrinsic motivation played in individual behavior. It was not until the mid-1980s Edward L. Deci and Richard Ryan wrote a book titled *Self-Determination and Intrinsic Motivation in Human Behavior* that SDT was formally introduced and accepted as a sound empirical theory. Since the 2000s, research into practical applications of SDT has increased significantly. The key research that led to the emergence of SDT included research on intrinsic motivation. Intrinsic motivation refers to initiating an activity because it is interesting and satisfying in itself to do so, as opposed to doing an activity for the purpose of obtaining an external goal (extrinsic motivation). A taxonomy of motivations has been described based on the degree to which they are internalized. Internalization refers to the active attempt to transform an extrinsic motive into personally endorsed values and thus assimilate behavioral regulations that were originally external.

Edward Deci and Richard Ryan later expanded on the early work differentiating between intrinsic and extrinsic motivation and proposed three main intrinsic needs involved in self-determination. According to Deci and Ryan, three basic psychological needs motivate self-initiated behavior and specify essential nutrients for individual psychological health and well-

being. These needs are said to be the universal and innate need for autonomy, competence, and relatedness.

Humanistic psychology has been influential in the creation of SDT. Humanistic psychology is interested in looking at a person's psyche and personal achievement for self-efficacy and self-actualization. Whether or not an individual's self-efficacy and self-actualization are fulfilled can affect their motivation.

To this day, it may be difficult for a parent, coach, mentor, and teacher to motivate and help others complete specific tasks and goals. SDT acknowledges the importance of the interconnection of intrinsic and extrinsic motivations as a means of motivation to achieve a goal. With the acknowledgment of interconnection of motivations, SDT forms the belief that extrinsic motivations and the motivations of others, such as a therapist, may be beneficial. However, it is more important for people to find the "why" behind the desired goal within themselves. According to Sheldon *et al.*, (2003) "Therapists who fully endorse self-determination principles acknowledge the limits of their responsibilities because they fully acknowledge that ultimately people must make their own choices". One needs to determine their reasons for being motivated and reaching their goal. SDT comprises The Organismic Dialectic approach, which is a meta-theory, and a formal theory containing mini-theories focusing on the connection between extrinsic and intrinsic motivations within society and an individual. SDT is continually being developed as individuals incorporate the findings of more recent research. As SDT has developed, more mini-theories have been added to what was originally proposed by Deci and Ryan in 1985. Generally, SDT is described as having either five or six mini-theories. The main five mini-theories are cognitive evaluation theory, organismic integration theory, causality orientations theory, basic needs theory, and goal contents theory. The sixth mini-theory that some sources include in SDT is called Relational Motivation Theory. SDT centers around the belief that human nature shows persistent

positive features, with people repeatedly showing effort, agency, and commitment in their lives that the theory calls inherent growth tendencies. "Self-determination also has a more personal and psychology-relevant meaning today: the ability or process of making one's own choices and controlling one's own life". The use of one's personal agency to determine behavior and mindset will help an individual's choices.

Self-determination theory posits that motivation ranges from extrinsic (e.g. grades or wanting to please) to intrinsic (e.g. satisfying personal goals) (Ryan & Deci, 2000). Students become intrinsically motivated when learning tasks give them a sense of autonomy, competence, relatedness, or purpose. Guiffrida *et al.* (2013) found students' self-reported grade point average and intent to persist were positively and significantly related to students' focus on subjects or activities closely related to their interests (autonomy) as well as an internal desire to challenge themselves (competence).

2.2 Conceptual Framework

The conceptual framework are concept of self-direct learning, concept of self-regulated learning and domain of self-regulation.

2.2.1 Concept of self-direct learning

The first definition of self-directed learning was written by Knowles (1975). He defined self-directed learning as "a process in which individuals take initiative with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human material resources for learning, choosing and implement appropriate learning strategies and evaluating learning outcomes". After Knowles his publication, the concept self-directed learning has become a subject of research for many years determining the characteristics of this concept. For example, Guglielmino (1973) focused on personal characteristics which are on influence on self-directed learning, where as Spear and Mocker (1984) focused on environmental determinants on self-directed learning. Besides that, self-directed learning has

been research from lots of different domains, such as educational sciences, human resource management, psychology and so on (Raemdonck, 2016). This widespread interest makes it hard to give an unambiguous definition of self-directed learning. Therefore, in this research it is chosen to use the comprehensive definition of Jossberger *et al.* (2010) who describe a self directed learner as “a student who is able to decide what needs to be learned next and how this can be accomplished best”.

Two forms of self-directed learning are distinguished by Raemdonck (2016), namely: self-directedness in learning processes (SDL) and self-directedness in career processes (SDC). The first form (SDL) refers to self-directedness in order to realize learning-related goals. For example, mastering new tasks or updating knowledge. A secondary vocational education student will need SDL in order to receive a diploma. The second form (SDC) is defined as “a characteristic adaption to influence career processes in order to cope for one self on the labour market (Raemdonck, 2016). This means that students are self- directed in career processes when they undertake career activities which result in the achievement of career-related goals. A secondary vocational education student needs the competence SDC after receiving the diploma.

Self-directed learning becomes more important, due to the changing labour market. In order to get a job, and to hold on to a job, students need to undertake action to develop themselves (Crant, 2015). This asks for self-directed students, who are capable of taking responsibility for directing their own career. The importance of self-directed learning is supported by many researchers, for example Wijers & Meijers (2017) argue that self- directedness helps people to see work opportunities and realize these, Meijers & Kuijpers (2017) argue that the unpredictability of the labour market asks for students who can identify opportunities and avail oneself on, and Jossberger *et al.* (2010) describe self-directed learning as a key competence to keep learning and to achieve high performance.

It can be concluded that it has been argued that students who are self-directed, will benefit from this competence during further life. There are empirical findings which support these argumentations. For example, empirical findings of Opengart and Short (2014) showed that self-directed learners paid more attention to their learning and development opportunities. Van Loo (2015) found that self-directed learners have more potential to find a new job in an external organization, in comparison with less self-directed learners, and findings of Raemdonck (2016) showed that self-directed learners were more able to realize future aspirations.

2.2.2 Concept of self-regulated learning

Self-regulated learning refers to a student's ability to understand, control and manage their learning environment (Schraw *et al.*, 2002). Self-regulated learning is an individual's ability to understand and control the learning environment. Zimmerman (1989) indicated that self-regulated learners plan, set goals, organize, self-monitor, and self-evaluate their learning rather than depend on teachers. Educators must develop skills with e-learning strategies to support students' use of self-regulated learning skills. Students employ self-regulated learning skills to prepare for face-to-face activities and discussions. Teachers can use traditional class time to encourage active and valuable student participation rather than the passive receipt of information. Hayon (2008) said that self-regulation usually refers to awareness and knowledge of one's learning and cognition and the control of one's cognition that renders this ability essential in learning and development. Recently, the concept has been studied intensively, except in professional learning. This is believed to be essential in student teacher learning since prospective teaching professionals are likely to be confronted with different challenges of learning and the learners. It is high time that they developed a sense of responsibility that aims to know every learner under their jurisdiction.

Self-regulated learning skills are based on classroom opportunities where students control their pace and design of learning. In this setting, students are responsible for their learning. This view, which suits the flipped learning model, encourages students to be self-driven as they complete tasks outside of the classroom in order to be prepared for in-class activities. To achieve this, students should be able to set personal goals and deploy effective learning strategies (Peng, 2012). Additionally, students should be able to monitor their learning behaviors (for example, knowing how to regulate their time and resources), as well as other appropriate strategies aimed at achieving their learning goals. Students with higher self-regulation levels are more effective in their learning, and are more successful in a flipped learning setting than those with low self-regulation levels (Winne, 2013).

Self-regulated learning (SRL) has many positive effects on the learning process, such as better learning in terms of being able to monitor, evaluate, and plan the learning process effectively, having better time-and-effort management, and demonstrating higher motivation for learning (Pintrich, 2000; Pintrich & De Groot, 1990; Zimmerman, 2008). Hence, learners able to learn in a self-regulated way can achieve better results. However, there are also studies suggesting that many learners have problems with this way of learning. Taking over control of one's own learning process and applying metacognitive strategies (i.e., monitoring, evaluating, and planning the learning) require specific metacognitive skills that not all students have (Mikroyannidis *et al.*, 2013). Therefore, learners often need guidance on different levels for learning in a self-regulated manner (Law *et al.*, 2017).

Zumbrunn, *et al.*, (2011) said that self-regulated learning (SLR) is recognized as an important predictor of student academic motivation and achievement. This process requires students to independently plan, monitor, and assess their learning. However, few students naturally do this well. Self-regulated learning is a process that assists students in managing their thoughts, behaviors, and emotions in order to successfully navigate their learning experiences. This

process occurs when a student's purposeful actions and processes are directed towards the acquisition of information or skills. Research shows that self-regulated students are more engaged in their learning. These learners commonly seat themselves toward the front of the classroom, voluntarily offer answers to questions, and seek out additional resources when needed to master content. Most importantly, self-regulated learners also manipulate their learning environments to meet their needs. Due to their resourcefulness and engagement, it is not then surprising that findings from recent studies suggest that self-regulated learners also perform better on academic tests and measures of student performance and achievement (Zimmerman, 2010).

Wolters (2013) said that self-regulated learning concerns the application of general models of regulation and self-regulation to issues of learning especially within academic contexts. Rio et. al (2017) state that learning to learn and learning to cooperate are two important goals for individuals. Moreover, self-regulation helps to prevent school failure. Learners high on self-regulation, both high and low-achieving, tend to exhibit a high sense of efficacy in their own capabilities. Therefore, schools should try to improve both, self-regulation and self-efficacy, to prevent school failure, because every student needs to feel the support to develop the belief that he/she can improve his/her knowledge and skills and learn.

2.2.2.1 Domains of Self-regulation

Memory Strategy

Memory strategies (traditionally known as mnemonics) have been found to enhance remembering through the connection of new knowledge with familiar words and images. Memory strategies, as one of the most effective strategies in the vocabulary learning process are extremely powerful mental tools. They include activities for remembering and retrieving the new information such as acronyms, key words, images etc. They help the learner to link

the second language item with the new one. In the study of Ghorbani (2015) that memory strategy instruction is useful for the long-term vocabulary retention. Since teaching memory strategies seems to have facilitated the process of long-term vocabulary retention, the findings are in line with Nemati (2017), Schmitt and Schmitt (2016), and Craik and Tulving (2016). However, they are different from Marefat and Shirazi's (2015) findings in which learners who received memory strategy instruction performed better in short-term retention test than long-term retention test. In Sozler's (2012) investigation, the results of the study suggest that successful vocabulary learning depends on the ways they are practiced. It has been proved that memory strategies help learners to integrate with the language and learn the vocabulary, which helps to recall them easily in the following phases of language teaching.

Goal Setting

Goals can be thought of as the standards that regulate an individual's actions (Schunk, 2014). In the classroom, goals may be as simple as earning a good grade on an exam, or as detailed as gaining a broad understanding of a topic. Short-term attainable goals often are used to reach long-term aspirations. Research also suggests that encouraging students to set short-term goals for their learning can be an effective way to help students track their progress. Similar to goal setting, planning can help students self-regulate their learning prior to engaging in learning tasks as this can help learners establish well thought out goals and strategies to be successful (Schunk, 2014). Teaching students to approach academic tasks with a plan is a viable method for promoting self-regulation and learning. Academically self-regulated students take time to plan. They know how to use time frames to schedule and pace their academic activities (Bandura & Cervone, 1986).

In the study of Morisano, *et al.*,(2018) it was found that setting goals and reflecting upon them improves academic success. Dotson (2015), based on his study, asserted that setting

goals keeps students focused on desired outcomes and provides a clear direction for success. The key to establishing goals that produce results is making them specific, measurable, attainable, relevant, and time sensitive. Furthermore, goals must be supported by a specific plan of action that outlines the steps to be taken to maximize success.

Self-Evaluation

Andrade (2017) defines self-evaluation as the act of monitoring one's processes and products in order to make adjustments that deepen learning and enhance performance. Student self-evaluation is the process by which the students gather information about and reflect on their own learning and is considered to be a very important component of learning. It occurs in the absence of external rewards or incentives and can therefore be a strong indicator that a learner is becoming more autonomous. By establishing their own learning goals and finding motivation from within to make progress toward those goals, students are more likely to persist through difficult learning tasks and often find the learning process more gratifying (Zimmerman, 2010).

William and Black (2010) study indicated that self-assessment and self-directed learning would have an effect on student's academic performance. Students are more likely to become self-regulated learners when they are able to evaluate their own learning, independent of teacher-issued summative assessments. This practice enables students to evaluate their learning strategies and make adjustments for similar tasks in their future. Teachers can promote self-evaluation in the classroom by helping students monitor their learning goals and strategy use, and then make changes to those goals and strategies based upon learning outcomes (Zimmerman, 2014).

Attention Control

In order to self-regulate, learners must be able to control their attention. Attention control is a cognitive process that requires significant self-monitoring. Often this process entails clearing the mind of distracting thoughts, as well as seeking suitable environments that are conducive to learning (e.g., quiet areas without substantial noise). Research indicates that students' academic outcomes increase with focused time spent on-task. Thus, teaching students to attend to learning tasks should be a priority. Teachers can help their students control their attention by removing stimuli that may cause distractions, and providing students with frequent breaks to help them build up their attention spans.

Students who are academically self-regulated understand and use problem-solving strategies. They select strategies to achieve their goals, sequence the strategies selected, set standards to gauge the quality of their performance, manage their attention, and monitor the degree to which they are acting in accordance with their standards and making progress in achieving their goals. If they become frustrated along the way, these students work to overcome the problem. They do not procrastinate and are aware of discrepancies among their actions, goals, and performance standards. When discrepancies are noted, academically self-regulated learners use this information to adjust their efforts and strategies. In addition, they try to take advantage of the help available and use routines and structure to help get their work done.

Self-Monitoring

To become strategic learners, students must assume ownership for their learning and achievement outcomes (Kistner *et al.*, 2010). Self-regulated learners take on this responsibility by monitoring their progress towards learning goals. The process of self-monitoring encompasses all of the aforementioned strategies. In order for a learner to self-monitor their progress, they must set their own learning goals, plan ahead, independently

motivate themselves to meet their goals, focus their attention on the task at hand, and use learning strategies to facilitate their understanding of material. Teachers can encourage self-monitoring by having students keep a record of the number of times they worked on particular learning tasks, the strategies they used, and the amount of time they spent working. This practice allows students to visualize their progress and make changes as needed.

Seeking Assistance

Contrary to popular belief, self-regulated learners do not try to accomplish every task on their own, but rather frequently seek help from others when necessary. What sets self-regulated learners apart from their peers is that these students not only seek advice from others, but they do so with the goal of making themselves more autonomous. Teachers can promote positive help seeking behaviors by providing students with on-going progress feedback that they can easily understand and allowing students opportunities to resubmit assignments after making appropriate changes.

In summary, self-regulated learners are able to set short- and long-term goals for their learning, plan ahead to accomplish their goals, self-motivate themselves, and focus their attention on their goals and progress. They also are able to employ multiple learning strategies and adjust those strategies as needed, self-monitor their progress, seek help from others as needed, and self-evaluate their learning goals and progress based upon their learning outcomes. Teachers at the primary and secondary levels can use the aforementioned strategies to promote self-regulation in their classrooms. However, teachers should understand that learners develop at various paces, and strategies that work best for one learner may not always work with the next.

Environmental Structuring

According to Mutua (2010), the distribution of secondary school students' performance in public examinations has been skewed towards the lower grades. This poor performance has been majorly attributed to school environmental factors and little has been done on individual psychological factors which may contribute towards students' academic achievement. The study was therefore designed to determine students' academic motivation and self-regulated learning as predictors of academic achievement. The main aim was to determine a prediction model of secondary school students' academic achievement given academic motivation and self-regulated learning. More specifically, the relationship among academic motivation, self-regulated learning and academic achievement was established.

Learning Responsibility

Responsibility has been defined in different ways in the literature. One of these definitions is, people assume the consequences of any event or behavior within its own limit of authority (TDK, 2014). According to Yiğittir's (2010) study, results have showed that parents of elementary students wish that responsibility value can be acquired in schools. Families have important roles in children gaining the responsibility value. Families can be taught in primary schools about the importance of value education, families roles when making children gain values, supporting the values at home in the context of school-family cooperation.

According to Farrington *et al.*(2012), not only in utilizing approaches that encourage growth of discrete skills or strengths such as self-regulation and collaboration, educators can shape students' overall attitude towards and beliefs about school. These academic mindsets strongly influence student behaviors, and thus, academic outcomes. They include students' beliefs about the value of school and how much they feel they belong, succeed, and grow there. Mindset is an area in which, compared to individual non-curricular learning skills,

there is more of a research base describing successful interventions. Academic mindsets might not at first sound skill-related, but these mindsets can be taught and developed. Furthermore, programs that target academic mindsets have encouragingly been shown to not only improve academic performance, but also to indirectly contribute to the growth of other non-curricular learning skills.

2.2.3 Facilities needed to enhance self-directed and self-regulated learning

Facilities needed to enhance were defined as key dimensions students identified that helped student self-directed and self-regulated learning and were within their control. Students identified four dimensions controlled by facilities that impacted directing their own learning and self-assessment:

1. class structure
2. curriculum design
3. technology
4. incentives

Class Structure

Similar to Van Etten *et al.* (2015) who stated that “a good syllabus in a course is key to student planning,” students indicated that classes with attendance policies and clear and relevant grading structures helped them learn, “She weighs it on you to take attendance, I mean it’s one hundred points.” Regarding grading structures, one student commented, “It helps when a professor has a clear grading structure. Another stated, “The best is when the grades are an indicator of how much you’ve actually learned.” This distinction between grades and learning is a concern for some students, “I kind of feel like the teachers sometimes always focus on grades rather than what you’ve learned.” Another stated, “The grades matter

when you are doing it, but afterwards, as long as you got something out of it, that is...most important.”

Curriculum Design

Students believed the curriculum design of the specific courses was a major predictor of their ability to manage their own learning and self-assessment. Job shadowing was helpful because students were able to gain “practice and experience...just by learning and being there.” One student commented that she was helped by “shadowing... people from geology departments even though it wasn’t really specific for the class. I got to see other departments, how they work. Especially since our major is so broad and I don’t know exactly what I want to do with a job (shadowing helps) in the long-term...I see different positions.” Although most students reported they had many group projects in their courses, many indicated independent projects would better help them self-direct their learning and self-assess. This was summed up by one student who said, “I like more independent projects because when you go to your job, it’s not going to be like, well, what is the answer? If you already get some kind of experience like, well, here’s your assignment, do the best you can, give it back to me as a memo or a report, I think that might be a little more beneficial (than a group project).” In regards to internship and clinical opportunities one student noted, “you have had like some real world experience... you can assess yourself- (and say) oh, I really need to be paying more attention to this...you need to be able to pick out what you really need to learn...when you are given a real situation, you can kind of say, well, that is what’s important.” Several students identified internships or clinicals as the preeminent goal of their time at the university, one stating, “Everything I do is to get that internship.”

Technology

Technology was seen as a facilitator depending on the student's college. Business students enjoyed a new building with increased technology, "we have all the smart classrooms, all the technology" and "there's lots of computer labs." These students acknowledged they benefitted from their new facility, "people have to fight for a computer" and "those classrooms are uncomfortable. I would not like to go there for four years." A lack of access to technology was seen as impeding the self-directed learning process, "I know one of our professors in our lab, she said if she could possibly get, you know 20 machines in the class, she could teach us so much. And that's what she wants to do but the school is not willing to give her the money to get the machines."

Incentives

Incentives for students were suggested by two of the business focus groups. Cash rewards or other forms of recognition seemed most likely to compel to these students to engage in self-directed learning and assessment. "The reason why we are all here right now is money. We...wouldn't be sitting in a marketing class for fun. I think money motivates you and getting a good job." Another commented, "We should get our name like on a plaque in the College of Business or we're on the television like all the time. [Group laughing] I'm serious, you know, recognition. Maybe cash rewards." Van Etten *et al.* (2015) also reported that rewards and the physical environment affected motivation. However, students in their study indicated external rewards were rare (e.g. admission to graduate school), so they tended to provide realistic self-rewards.

2.2.4 Teachers attitude towards enhancing self-directed and self-regulated learning

Teachers need to be trained with the skills to facilitate self-directed and self-regulated learning in their classrooms (Shireen et al., 2015). One issue that most teachers faced is to

establish an optimal self-directed and self-regulated learning environment with an effective instructional process. Apparently, Raemdock (2015) argued that when adults entering a training setting, formal classroom, or self-directed learning activity come with a variety of needs, differences, and expectations, therefore, the learning environment must be able to accommodate.

Fortunately, teacher attitudes and class structures can support students' intrinsic motivation. Teachers who have high expectations and truly believe that their students can meet them are likely to provide the necessary support for student success. Similarly, when students feel teachers believe in their abilities, they often are more motivated to achieve (Herman, 2016). Another way to encourage students to build their own knowledge is through sustained collaborative activities (relatedness). Learning occurs as students present information to and assess each other with the aim to create new knowledge through work on shared projects (Paavola & Hakkarainen, 2015). However, for peer teaching to be successful, teachers must provide significant guidance to the learners (Kirschner *et al.*, 2016).

Encouraging students to become involved in developing course requirements (purpose) also increases their internal motivation to learn (Herman, 2016). The more control students have in their learning process, the more they sharpen their ability to sort through presented information as well as critically reflect and analyze their performance (Trigwell & Prosser, 2013). Additionally, student-directed assessment can be utilized as a learning tool that can positively impact self-reflection and analysis (Dochy, 1992; Glaser, 1990).

A higher level of individual attention is also required of teachers as students need support and direction in making the transition to self-directed and self-regulated learning (University of Idaho, 2015). The best way to instruct adults is through an individualized process in order to help learners assume more responsibility for their own learning. On that note, it means that

an effective teacher for adult learners must be responsible for helping learners to become more self-sustained, intellectually curious, and capable of learning by themselves. This statement refers to the role and skills of facilitators to facilitate self-directed and self-regulated learning. In addition, the lecturers should be competent themselves in online learning (Hiemstra 2013).

A study by Schmidt *et al.*, (2011) found that students who had tutors with subject matter experts and a good tutoring skills tend to engage in more self-directed and self-regulated learning behaviors. Another study by Egan and Akdere (2014) had surveyed among the educators. The educators were to identify key roles, outputs, and competencies of Distance Education professionals, rate the importance of these competencies and outputs. The findings showed that educators need to adapt teaching patterns to technology, maintain interaction, engage learners, and collaborate with others in course development. Teachers wanted more training on how to foster interaction with the students, design visual aids, and deal with technicians and site coordinators and how to use the technology more efficiently. In addition to that they highlighted important factors that include: praising students, calling them by name, smiling, and providing individual feedback. These factors will create confidence and motivation for students. Another key factor is communication. Communication between students at different sites, the teacher, and the support staff is important. An effective interaction between student and technology is needed to impart an appropriate collaboration use. Activities to promote interaction among students is also important. Finally, teachers need to develop teamwork among students at various sites for more involvement.

One prevalent issue that most teachers faced is to establish an optimal self-directed and self-regulated learning environment with an effective instructional process. As the adults entering a training setting, formal classroom, or self-directed and self-regulated learning activity, it comes with a variety of needs, differences, and expectations. Therefore, such

varieties must be met as to accommodate the survival of the self-directed and self-regulated learning environment (Raemdock *et al.*, 2012; Kvan, 2013).

The web that facilitates self-directed and self-regulated learning must have these characteristics that include; firstly provisions of facilities and support services such as the study skills programs that can help learners to locate resources using the electronic library and links. Study skill programs refer to induction courses and computer competency training as the examples. Secondly, the provision of services such as e-mail, forum, and chat that give opportunity for learners to get connected.

On the other hands, characteristics of support that can facilitate self-directed and self-regulated learning will include; the availability of technical support to assist learners when they have technical difficulties, orientation on how to adapt to the web- based that is the learning environment. Lastly, the technology which must be designed and developed as simple as possible for easy use.

2.3 Review of Related Empirical Studies

Broadbent (2017) investigates the online and blended students' use of self-regulated learning strategies in a higher education context. She found that students use self-regulated learning strategies equivalent in both online and blended settings. She also highlights that self-regulated learning strategies could improve students' academic performance. Additionally, Broadbent and Poon (2015) reviewed several studies that explore the use of self-regulated learning strategies in the online higher education context. They found that self-regulated learning strategies are positively correlated to students' academic success, highlighting the strategies of time management, metacognition, critical thinking, and effort regulation in particular. Another study was conducted by Lai and Hwang (2016) to compare between a self-regulating flipped classroom and conventional flipped classroom in an elementary school mathematics course in terms of academic achievement, self-regulated learning skills, and

self-efficacy. One result of their study showed that students with higher self-regulated learning skills had significantly better academic achievement.

Littlejohn et al. (2016) studied the effect of self-regulated learning on the behaviour and the employment of self-regulated learning skills of students who enroll in a MOOC. Their study identified differences in behaviour associated with five self-regulated learning sub-processes including motivation and goals setting, self-efficacy, task interest value, task strategies, and self-satisfaction and evaluation, in favour of the students with higher self-regulated learning.

The study by Ng (2018) examines the effectiveness of flipped classroom pedagogy, concerning self-regulation skills, to enhance formative learning outcomes for first-year university students. The study suggests that flipped classroom pedagogy was effective enabling students to achieve all self-regulated learning skills. Alten, Phielix, Janssen, and Kester (2020) investigate the effects of self-regulated learning skills support included in the pre-class (home) activities in a flipped classroom setting on students' self-regulated learning skills and learning outcomes. Their findings involve evidence of the role of flipped learning in stimulating students to perform self-regulated learning skills. Jovanović *et al.* (2017) suggest that the success of students in flipped learning settings depends on the extent to which the students use of self-regulated learning skills. Students with low self-regulated learning skills would need more help and scaffold from the teachers to develop their skills and consequently achieve their goals. The flipped learning settings can provide such scaffold and help to develop these skills through undertaking and completing well-defined and structured preparatory activities. Similarly, the study of Sun, Xie, and Anderman (2018) recommended that it is essential to make flipped classrooms effective for academic achievement. For higher achievement, flipped classrooms should enact appropriate strategies in order to support learners in enhancing self-regulation.

Regarding the style in self-directed learning, Abdel-Hady et al. (2013) studied the readiness of self-directed learning and the learning style of nursing students at Saudi Arabia University. This study was performed to determine the readiness in self-directed learning of nursing students in Saudi Arabia; to define their style of learning and to find the link between the two concepts. The high degree of self-directed learning and the dominant converging learning style among nursing students will have positive implications for their post-work regular nursing education and learning (Abdel-Hady El-Gilany, Fawzia El Sayed Abusaad, 2013).

Tim Piper *et al.* (2018), studied to develop the scale of self-directed learning for the exercises. Development and validation of the scores in self-directed learning would be explored. The self-directed system for the scale has been tested on 368 people with exercising autonomy and 217 new ones. The score from the tool shows a high level of valid support and predictability for classifying the practitioner. The purpose of this study is to develop and provide strong evidence for scores from a measure of the self-directed learning in people who do physical exercise. The tool developed for this study will be called the scale for exercises of self-oriented learning (Tim *et al.*, 2018).

2.4 Summary of Literature Reviewed

The study reviewed on two theoretical framework which are constructivist and self determination theory. The constructivist theory, students build their own understanding of a subject through engaged activities, rather than passively accepting information presented to them. Teachers can support students' constructivism by asking good questions, listening to students' needs, and creating environments that allow students to make choices that reinforce the overall goals for courses. Self determination theory posits that motivation ranges from extrinsic to intrinsic. Students become intrinsically motivated when learning tasks give them a sense of autonomy, competence, relatedness, or purpose. The study also reviewed on some

conceptual frameworks among them are concept of self-directed learning, concept of self-regulated learning and facilities needed to enhance self-directed and self-regulated learning.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design that will be adopted for this study is a survey research design where questionnaires will be used as source for opinions of respondents on the strategies for facilitating self direct and self regulated learning for technology education students in higher institutions in Niger State. The survey research design will be chosen as an appropriate method for the research as it seeks the views of people about a particular issue that concerns them, give room for researcher to study the group of people and items to source for information from the respondents.

3.2 Population of the Study

The population of this study will comprises of Technology Education teachers and students in Niger State from selected tertiary institution. This is shown in table 3.1 below.

Table 3.1: Distribution of the population of the study

S/N	Institution Name	Students	Teachers
1	Federal University of Technology Minna	530	25
2	Ibrahim Badamasi Babangida University Lapai	320	20
3	Niger State College of Education		20
	TOTAL	850	65

3.3 Sampling and Sampling Technique

A simple random sampling technique will be used to sample 100 students and 5 teachers each from the schools in the population of the study. 300 students and 15 teachers will be sampled randomly from the population of the study. As shown in table 3.2 below

Table 3.2: Distribution of sample

S/N	Institution Name	Students	Teachers
1	Federal University of Technology Minna	100	5
2	Ibrahim Badamasi Babangida University Lapai	100	5
3	Niger State College of Education	100	5
	TOTAL	300	15

3.4 Research Instrument

The questionnaire is the main instrument that will be used by the researcher for the data collection for the study. The questionnaire is structured under two sections. Section A consisting of respondents personal data, while Section B is the research questions.

3.5 Validity of the Research Instrument

The instrument will be validated by three lecturers in the Department of Industrial and Technology Education, Federal University of Technology Minna. The validator's suggestions and correction will be incorporated in the final draft of the instrument in order to ensure that the instrument will be capable of eliciting necessary information that needed for the study

3.6 Reliability of the Instrument

The instrument will be administered to 25 respondents who were five (5) Teachers and twenty (20) students in Abuja, State, which were not part of the study sample to ensure the

reliability after modification. Their responses will be used to calculate the reliability coefficient using cronbach alpha

3.7 Method of Data Collection

An introductory letter will be collected from the Department of Industrial and Technology Education and submitted to various technical colleges to notify and request for their approval before administering the questionnaire. The questionnaire will be administered by the researcher with two other trained research assistants.

3.8 Method of Data Analysis

The data collected will be analyzed using mean and standard deviation. The null hypotheses were tested using t-test at 0.05 level of significance.

3.9 Decision Rule

In order to determine the level of acceptance or rejection of any items, a mean score of 2.50 will be used. Therefore any item with a mean responses of 2.50 and above will be accepted and any item with a response of 2.49 and below will be rejected. The mean of each item was computed by multiplying the frequency of each response mode with appropriate nominal value and divided by the sum obtained under each item with the number of the respondent to an item.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Result

Research Question One

What is self actualisation towards self directed and self regulated learning by technology education students?

Table 4.1

Mean responses of the students and teachers regarding self actualisation towards self directed and self regulated learning by technology education students

N₁ = 300, N₂ = 15

S/N	ITEMS	X ₁	X ₂	SD ₁	SD ₂	X _T	Remarks
1	Self-evaluation	2.62	2.75	0.59	0.74	2.66	Required
2	Organizing and transforming	3.13	3.14	0.39	0.40	3.13	Required
3	Goal-setting and planning	2.19	2.22	0.55	0.50	2.20	Not Required
4	Seeking information	2.23	2.02	0.49	0.32	2.16	Required
5	Keeping records and monitoring	2.50	2.24	0.54	0.51	2.51	Required
6	Environmental structuring	2.12	2.00	0.48	0.49	2.08	Not Required
7	Self-consequences	2.32	2.14	0.53	0.45	2.26	Not Required
8	Rehearsing and memorizing	3.26	3.08	0.59	0.48	3.20	Required
9	Seeks assistance from peers	2.19	2.08	0.49	0.34	2.15	Not Required
10	Seeks assistance from teachers	2.79	2.77	0.54	0.76	2.78	Required

Key

- N_1 = Number of Students
 SD_1 = Standard deviation of Students
 N_2 = Number of Teachers
 SD_2 = Standard deviation of Teachers
 X_1 = Mean of Students
 X_2 = Mean of Teachers
 X_T = average mean of Students and Teachers

The result presented in table 4.1 above revealed that the groups of respondent are required with the items 1,2,4,5,8 and 10 with the average mean ranging from 3.20 -2.51 and not required with items 3,6,7 and 9 with mean scores ranging between 2.08- 2.26, on the self actualisation towards self directed and self regulated learning by technology education students.

4.2 Research Question Two

What are the facilities needed to enhance self-directed and self regulated learning among technology education students?

Table 4.2

Mean response of teachers and student regarding the facilities needed to enhance self-directed and self regulated learning among technology education students.

$N_1 = 300, N_2 = 15$

S/N	ITEM	X_1	X_2	SD_1	SD_2	X_T	Remarks
1.	electronic library and links	3.33	3.00	0.65	0.90	3.17	Required
2.	computer competency training	2.92	2.54	0.67	0.75	2.73	Required
3.	Provision of Email	2.67	2.43	0.89	0.79	2.60	Required
4.	Provision of Forum to chat and discussed	2.83	2.43	0.72	0.74	2.73	Required
5.	Availability of technical support to assist learners when they have technical difficulties	2.83	2.68	0.72	0.95	2.76	Required
6.	Orientation on how to adapt to the web- based that is the learning environment	2.92	2.54	0.67	0.69	2.73	Required

7.	Consistent internet facilities	2.92	2.96	0.67	0.79	2.94	Required
8.	Conducive classroom	2.50	2.32	0.67	0.72	2.56	Required
9.	Consistent Power Supply	2.67	2.36	0.89	0.56	2.65	Required
10.	Text books	2.83	3.21	0.94	0.83	3.02	Required

Key

- N_1 = Number of Students
 SD_1 = Standard deviation of Students
 N_2 = Number of Teachers
 SD_2 = Standard deviation of Teachers
 X_1 = Mean of Students
 X_2 = Mean of Teachers
 X_t = average mean of Students and Teachers

The result presented in table 4.2 above revealed that the groups of respondent are required with all the items with the average mean ranging from 2.60 – 3.17 on the facilities needed to enhance self-directed and self regulated learning among technology education students.

4.3 Research Question Three

What are the teachers attitude towards enhancing self directed and self regulated learning among technology education students?

Table 4.3

Mean responses of teachers and students regarding teachers attitude towards enhancing self directed and self regulated learning among technology education students

$N_1 = 300, N_2 = 15$

S/N	ITEMS	X_1	X_2	SD_1	SD_2	X_t	Remarks
1.	Teachers need to be trained with the skills to facilitate self-directed learning in their classrooms	2.99	3.14	0.58	0.75	3.07	Required
2.	Establishing an optimal self-directed learning environment with an effective instructional process	3.09	3.33	0.47	0.55	3.21	Required

3.	A higher level of individual attention is also required of the teacher	2.97	2.86	0.41	0.69	2.92	Required
4.	Students need support and direction in making the transition to Self-directed and self regulating learning	3.06	3.22	0.28	0.50	3.14	Required
5.	Teachers establishes an individualized process in order to help learners assume more responsibility for their own learning	3.04	3.06	0.20	0.47	3.05	Required
6.	Teachers are not competent in online learning	2.97	2.96	0.44	0.53	2.97	Required
7.	Teachers need to adapt teaching patterns to technology	3.18	3.10	0.58	0.67	3.14	Required
8.	Teachers should always maintain good interaction with students	3.01	3.02	0.39	0.58	3.02	Required
9.	Teachers must always engage learners	3.04	3.09	0.42	0.59	3.07	Required
10.	collaborate with others in course development	2.56	2.87	0.34	0.42	2.72	Required

Key: N_1 = Number of Student' SD_1 = Standard deviation of Students' N_2 = Number of Teachers' SD_2 = Standard deviation of Teachers X_1 = Mean of Students' X_2 = Mean of Teachers' X_t = average mean of Students and Teachers

The result presented in Table 4.3 above revealed that all the items are required average mean scores ranging from 3.17 – 2.93 on the teachers attitude towards enhancing self directed and self regulated learning among technology education students

4.4 Hypotheses One

There is no significant difference between the mean response of teachers and student on self actualisation towards self directed and self regulated learning by technology education students

Table 4.4

t-test analysis of Students' and Teachers regarding self actualisation towards self directed and self regulated learning by technology education students

S/N	RESPONDENTS	N	\bar{x}	SD	d.f	t-cal	t-critical
1	Students'	300	2.54	0.52	313	-0.68	1.98
2	Teachers	15	2.44	0.49			

Key: N₁ = Number of Students' SD₁ = Standard deviation of Students' N₂ = Number of Teachers' SD₂ = Standard deviation of Teachers' T= t-test value of Students' and Teachers' Df = degree of freedom' NS = Not significant

The analysis in table 4 shows that the t-cal values of all the 10 items are needed. There was no significant difference between the mean response of teachers and student on self actualisation towards self directed and self regulated learning by technology education students Therefore the null hypothesis was accepted.

4.5 Hypotheses Two

There is no significant difference between the mean response of teachers and student on the facilities needed to enhance self-directed and self regulated learning among technology education students

Table 4.5

T-test analysis of Students and Teachers regarding the facilities needed to enhance self-directed and self regulated learning among technology education students

S/N	RESPONDENT	N	\bar{x}	SD	d.f	t-cal	t-critical
1	Students'	300	2.84	0.75	313	-1.15	1.98
2	Teachers	15	2.65	0.77			

Key; N₁ = Number of Students' SD₁ = Standard deviation of Students' N₂ =Number of Teachers' SD₂ = Standard deviation of Teachers' T = t-test value of Students' and Teachers' Df = Degree of freedom' NS = Not significant.

The analysis in table 4.2 shows that the t-cal values of all the 10 items are required. There was no significant difference between the mean response of teachers and student on the facilities needed to enhance self-directed and self regulated learning among technology education students. Therefore the null hypothesis was accepted.

4.6 Hypothesis Three

There is no significant difference between the mean response of teachers and student on teachers attitude towards enhancing self directed and self regulated learning among technology education students.

Table 4.6: T-test analysis of Students' and Teachers regarding teachers attitude towards enhancing self directed and self regulated learning among technology education students

S/N	RESPONDENT	N	\bar{x}	SD	d.f	t-cal	t-critical
1	Students'	300	3.04	0.42	313	0.31	1.98
2	Teachers	15	3.09	0.59			

Key; N₁ = Number of Students' SD₁ = Standard deviation of Students' N₂ = Number of Teachers' SD₂ = Standard deviation of Teachers' T = t-test value of Students' and Teachers' S = Significant' NS = Not significant.

The analysis in table 4.6 shows that the t-cal values of all the 10 items are required. There was no significant difference between the mean response of teachers and student on teachers attitude towards enhancing self-directed and self-regulated learning among technology education students. Therefore the null hypothesis was accepted.

4.7 Finding of the Study

The following were the findings of the study.

1. There is self-actualisation towards self-directed and self-regulated learning by technology education students.
2. Most of the facilities are required for the respondents on the facilities needed to enhance self-directed and self-regulated learning among technology education students
3. Most of the respondents are required positive teachers attitude towards enhancing self-directed and self-regulated learning among technology education students.
4. There was no significant difference between the mean response of teachers and student on self-actualisation towards self-directed and self-regulated learning by technology education students.
5. There was no significant difference between the mean response of teachers and student on the facilities needed to enhance self-directed and self-regulated learning among technology education students.
6. There was no significant difference between the mean response of teachers and student on teacher's attitude towards enhancing self-directed and self-regulated learning among technology education students.

4.8 Discussion of findings

The findings on research question revealed that most of the items are required on the self actualisation towards self directed and self regulated learning by technology education

students. The findings of the study corroborate with Broadbent (2017) investigates the online and blended students' use of self-regulated learning strategies in a higher education context. She found that students use self-regulated learning strategies equivalent in both online and blended settings. She also highlights that self-regulated learning strategies could improve students' academic performance. Additionally, Broadbent and Poon (2015) reviewed several studies that explore the use of self-regulated learning strategies in the online higher education context. They found that self-regulated learning strategies are positively correlated to students' academic success, highlighting the strategies of time management, metacognition, critical thinking, and effort regulation in particular.

The findings on research question two revealed that most of the facilities are required for the respondents on the facilities needed to enhance self-directed and self regulated learning among technology education students. The findings of the study is inline with Van Etten *et al.* (2015) stated that facilities needed to enhance were defined as key dimensions students identified that helped student self-directed and self-regulated learning and were within their control. Another study also supported by Herman (2016) the more control students have in their learning process, the more they sharpen their ability to sort through presented information as well as critically reflect and analyze their performance (Trigwell & Prosser, 2013). Additionally, student-directed assessment can be utilized as a learning tool that can positively impact self-reflection and analysis

The findings on research question three shows that most of the respondents are required positive teachers attitude towards enhancing self directed and self regulated learning among technology education students. According to the statement of Shireen et al. (2015) teachers need to be trained with the skills to facilitate self-directed and self-regulated learning in their classrooms. Apparently, Raemdock (2015) argued that when adults entering a training setting, formal classroom, or self-directed learning activity come with a variety of needs,

differences, and expectations, therefore, the learning environment must be able to accommodate. Fortunately, teacher attitudes and class structures can support students' intrinsic motivation. Teachers who have high expectations and truly believe that their students can meet them are likely to provide the necessary support for student success. Similarly, when students feel teachers believe in their abilities, they often are more motivated to achieve.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the study

The study investigate strategies for facilitating self-direct and self-regulated learning for technology education students in higher institutions in Niger state. The objectives of the study are self actualisation towards self directed and self regulated learning by technology education students, facilities needed to enhance self-directed and self regulated learning among technology education students and teachers attitude towards enhancing self directed and self regulated learning among technology education students. The research questions of the study is what is self actualisation towards self directed and self regulated learning by technology education students, what are the facilities needed to enhance self-directed and self regulated learning among technology education students, what are the teachers attitude towards enhancing self directed and self regulated learning among technology education students. The study summarised that technology education rise of self directed and self-regulated learning and the prevalence of affordable devices have laid the foundation for digital learning.

5.2 Implication of the study

The study implies that there is required self actualisation towards self directed and self regulated learning by technology education students and it also implies that most of the facilities are required for the respondents to enhance self-directed and self regulated learning among technology education students.

5.3 Contribution to knowledge

The study contribute to knowledge by establishing that facilities are required to enhance self-directed and self regulated learning among technology education students. The study also

establishes that the teachers required positive attitude towards enhancing self directed and self regulated learning among technology education students.

5.4 Conclusion

The study investigate the strategies for facilitating self directed and self regulated learning for technology education students in higher institutions. Three objectives were formulated for the study, three research questions were raised to guide the study and three hypothesis were formulated at 0.05 level of significance. The findings of the study revealed that there is required self actualisation towards self directed and self regulated learning by technology education students. It was also revealed that most of the facilities are required for the respondents to enhance self-directed and self regulated learning among technology education students. Furthermore the study also shows that the teachers required positive attitude towards enhancing self directed and self regulated learning among technology education students.

5.5 Recommendations

Based on the findings of the study, the following recommendations were made

1. Teachers need to be trained with the required skills to facilitate self-directed learning in their classrooms
2. Students are needed to be supported and direction in making the transition to Self-directed and self regulating learning in technology education.
3. Teachers need to adapt teaching patterns to technology for self-directed and self regulating learning
4. Teachers should always a maintain good interaction with students
5. The government and school administrator need to provide the necessary facilities for self-directed and self regulating learning in technology education.

5.6 Suggestion for Further Studies

1. Effect of self-regulated learning on the behaviour and the employment of self-regulated learning skills of students who enroll in a MOOC (a case study of National Open University).
2. Effectiveness of flipped classroom pedagogy, concerning self-regulation skills, to enhance formative learning outcomes for first-year university students.

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**QUESTIONNAIRE FOR STRATEGIES FOR FACILITATING SELF DIRECT AND
SELF REGULATED LEARNING FOR TECHNOLOGY EDUCATION STUDENTS
IN HIGHER INSTITUTIONS IN NIGER STATE**

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE

SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

INTRODUCTION: please kindly complete this questionnaire by ticking (✓) the column that best represent your perception about the topic. The questionnaire is for research purpose and your view will be confidentially and strictly treated in response to the purpose of this research work.

SECTION A

PERSONAL DATA

Student :

Teacher:

Note; A four point scale is used to indicate your opinion, tick the option which best describe your agreement as shown below.

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

SECTION B

Respond options for this section are:

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

RESEARCH QUESTION ONE

What is self actualisation towards self directed and self regulated learning by technology education students?

S/N	ITEMS	HR	MR	R	NR
1	Self-evaluation				
2	Organizing and transforming				
3	Goal-setting and planning				
4	Seeking information				
5	Keeping records and monitoring				

6	Environmental structuring				
7	Self-consequences				
8	Rehearsing and memorizing				
9	Seeks assistance from peers				
10	Seeks assistance from teachers				

SECTION C

Respond options for this section are:

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

RESEARCH QUESTION TWO

What are the facilities needed to enhance self-directed and self regulated learning among technology education students?

S/N	ITEM	HR	MR	R	NR
1	electronic library and links				
2	computer competency training				
3	Provision of Email				
4	Provision of Forum to chat and discussed				
5	Availability of technical support to assist learners when they have technical difficulties				
6	Orientation on how to adapt to the web- based that is the learning environment				
7	Consistent internet facilities				
8	Conducive classroom				
9	Consistent Power Supply				
10	Text books				

SECTION D

Respond options for this section are:

Highly Required = HR, Moderately Required = MR, Required= R, Not Required= NR

RESEARCH QUESTION THREE

What are the teachers attitude towards enhancing self directed and self regulated learning among technology education students?

S/N	ITEMS	HR	MR	R	NR
1	Teachers need to be trained with the skills to facilitate self-directed learning in their classrooms				
2	Establishing an optimal self-directed learning environment with an effective instructional process				
3	A higher level of individual attention is also required of the teacher				
4	Students need support and direction in making the transition to Self-directed and self regulating learning				
5	Teachers establishes an individualized process in order to help learners assume more responsibility for their own learning				
6	Teachers are not competent in online learning				
7	Teachers need to adapt teaching patterns to technology				
8	Teachers should always a maintain good interaction with students				
9	Teachers must always engage learners				
10.	collaborate with others in course development				